

KNIGHT
MODEL KN4035 (35DU805)

KNIGHT
MODEL KN4035 (35DU805)

GENERAL INFORMATION

The Knight Model KN4035 is a two-speed, dual-track tape recorder. The transport holds any size reels up to seven inches.

Recordings can be made from a radio, TV receiver, phonograph, tuner, or directly from a microphone.

The transport operates at two speeds; 3 3/4 and 7 1/2 ips.

Connect the tape recorder to a power source supplying 105-120 volts, 60 cycles, AC only.

Supplied By:

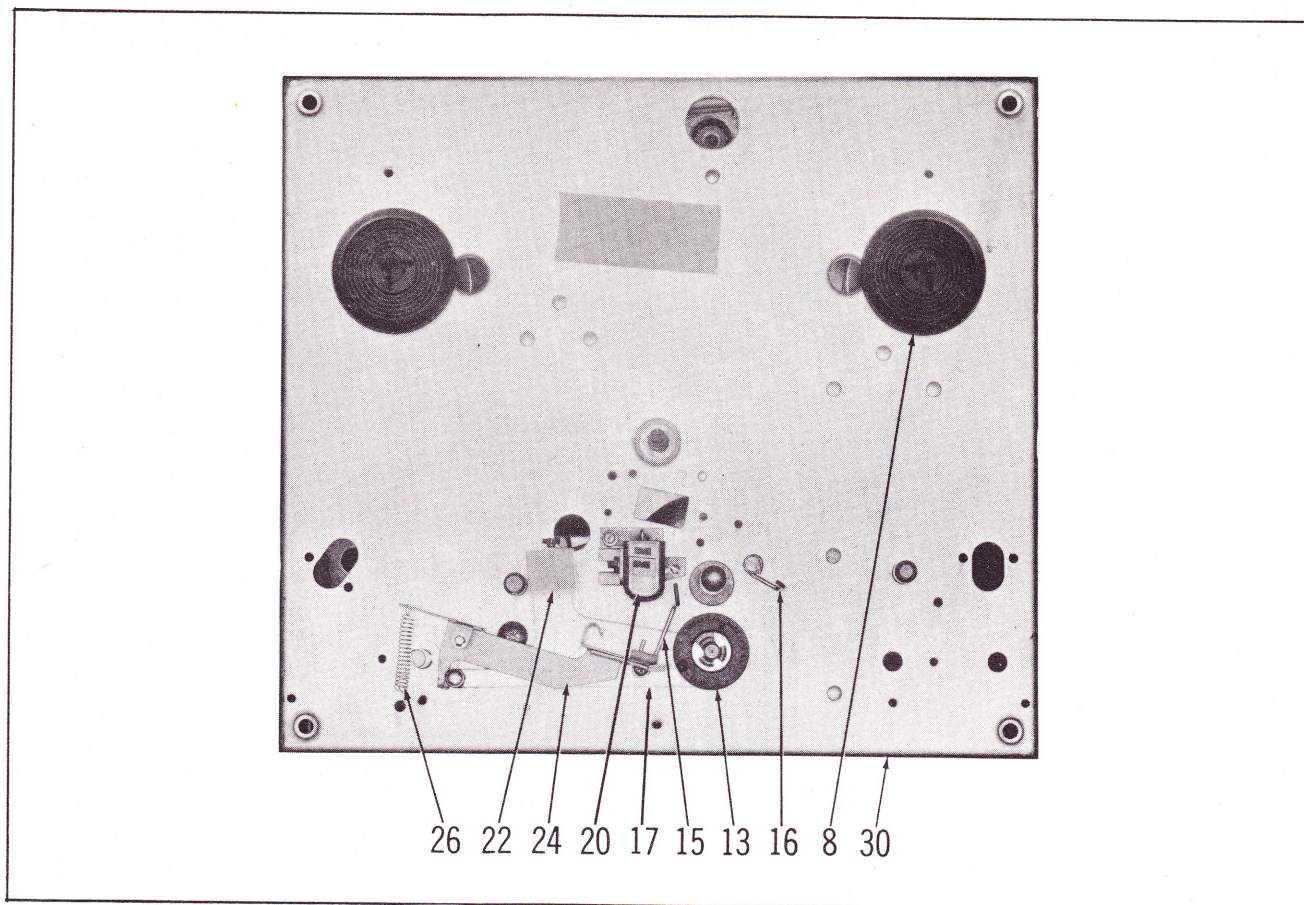
Allied Radio
100 North Western Avenue
Chicago, Illinois

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana



The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of CQ528

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1962 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



TOP VIEW OF MECHANISM WITH COVERS REMOVED

FUNCTION OF CONTROLS

Off-Volume

Turns the power off or on and varies the playback volume and recording level.

Function Control

Selects the various modes of operation, Play, Idle (Stop), and Record.

Record Button

When depressed, sets the amplifier and transport in the Record mode.

Wind-Rewind Control

Rotate clockwise to rewind the tape and counter-clockwise to wind in the forward direction. Function control must be in Idle position before Wind-Rewind control can be operated.

Speed Change

Changes transport speed to $3 \frac{3}{4}$ or $7 \frac{1}{2}$ ips. Change speeds when the Function control is in the Idle position only.

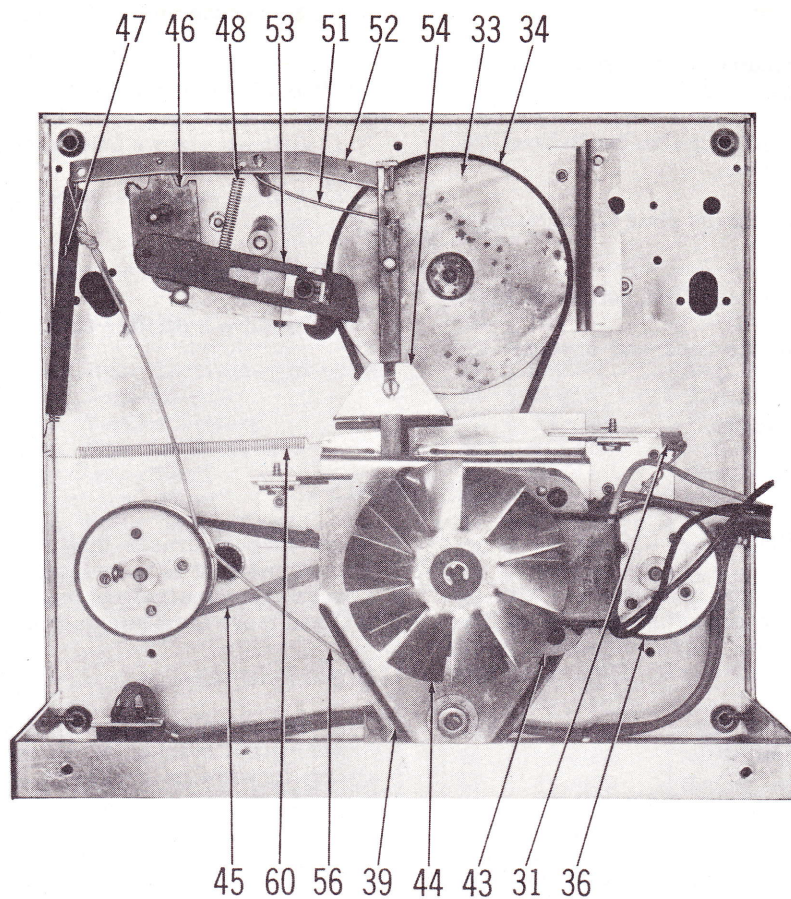
OPERATING INSTRUCTIONS

Threading the Tape

1. Place a reel of tape on the supply spindle.
2. Place an empty reel of the same size on the take-up spindle.
3. Unwind about 18 inches of tape from the supply reel and place the tape through the head slot, making sure that the shiny side faces the front of the recorder.
4. Insert the end of the tape into one of the radial slots in the hub of the take-up reel. Rotate the take-up reel several times to secure the tape and take up any slack.

To Make a Recording

1. Insert the microphone plug into the "Mic" jack on the top of the recorder.
2. Thread the tape as described under "Threading the Tape."
3. Set the Speed Change control to the desired speed.
4. Press down on the Record button and at the same time, move the Function control to the Record position.



BOTTOM VIEW OF MECHANISM

NOTE: To record from a radio, phonograph, tuner, or TV receiver, follow the same procedure as described above, keeping the volume of recorder at a normal level.

6. To stop movement of the tape, turn the Function control to the Idle position.

To Wind or Rewind Tape

Check to see that the Function control is in the Idle position. To wind the tape onto the take-up reel, turn the Wind-Rewind control to the Wind position and hold. To rewind the tape back onto the supply reel, turn the control to the Rewind position and hold. Releasing the knob will automatically stop the tape movement.

To Play Back a Recording

1. Thread the tape.
2. Turn the Function control to the Play position.
3. Adjust the Volume control to the desired listening level.

To Erase a Recording

In the Record mode of operation, any recording on the tape will be automatically erased before the new recording is made. Should it be desired to erase

a recording without recording new material on the tape, follow the normal recording procedure with the Volume control at minimum.

Dual-Track Recording

This recorder is designed to record and play back one-half the tape width at a time; thereby, resulting in two-track recording. After one side of the tape is completed, remove the full reel from the take-up spindle and place it on the supply spindle and the empty reel on the take-up spindle. Rethread the tape and continue recording. The tape is played back in the same manner.

To Edit and Splice Tape

NOTE: Since it is impossible to edit and splice one track without affecting the other track, recordings to be edited should be limited to one track recordings only.

1. The tape may be edited by cutting out unwanted portions or by joining selections into another sequence. Announcements may be inserted between selections. Unused portions of the tape can be spliced together for reuse.
2. Cut the tape at a diagonal. Join the ends using a commercial splicing tape only. Trim away excess splicing tape.

DISASSEMBLY

1. Remove control knobs.
2. Remove screws holding front escutcheon (6).
Remove front escutcheon.
3. Remove screws holding rear escutcheon (5).
Remove rear escutcheon.
4. Remove screws from dress plate (7) and remove dress plate.
5. Remove screws from sides and bottom of case.
6. Slide recorder chassis back and unsolder the speaker leads.
7. Lift recorder from case.

8. To reassemble, reverse the foregoing procedure.

To Remove Amplifier from Transport.

1. Remove screws holding chassis to transport.
2. Loosen screw on selector lever and slide from shaft.
3. Slide bushing from on-off-volume shaft.
4. Remove amplifier chassis from transport.

ADJUSTMENTS

Record-Playback Head Height

The top edge of the tape must be even with the top edge of the pole piece of the head. To adjust, loosen the two head mounting nuts and raise or lower the head to meet above requirement. Tighten the nuts and recheck adjustment.

Record-Playback Head Azimuth

Using an alignment tape, adjust the azimuth adjustment screw until the maximum high-frequency output is obtained. After the azimuth adjustment is completed, recheck the record-playback head height.

Erase Head Height

Erase head (22) should be adjusted so that the

erase magnet erases only the top half of the tape. This adjustment is to be made in the Record position. Loosen the set screw in the rear of the erase head (22) and move the head up or down as necessary.

Brake Release

Brake release bracket (54) can be adjusted by loosening the bracket screw and moving the bracket either forward or backward. When bracket (54) is moved to the rear, wind-rewind lever assembly (50) contacts brake release bracket (54) causing brake cord to have a greater amount of slack. To tighten the brake cord, move the bracket toward the front of the unit. Repeat adjustment until proper braking action is obtained.

TROUBLE CHART

| SYMPTOM | CAUSE | REMEDY |
|------------------------------------|--|---|
| Incomplete or no erase. | 1. Erase head set screw loose. | 1. See "Erase Head Height" adjustment. |
| No drive in Play or Record. | 1. Drive belt (34) broken. 2. Pressure roller tension spring (48) broken or disconnected. 3. Take-up drive belt (42) broken. 4. Defective drive motor (43). 5. Flywheel shaft binding. | 1. Replace drive belt (34). 2. Connect or replace spring (48). 3. Replace take-up drive belt (42). 4. Replace motor (43). 5. Clean Flywheel bearings and apply a thin film of oil to shaft. |
| No Rewind. | 1. Rewind belt (45) broken. 2. Oil on rewind belt (45). | 1. Replace belt (45). 2. Clean or replace belt (45). |
| Wow or flutter. | 1. Motor pulley, pressure roller (13), or capstan dirty. | 1. Clean oil and dirt from parts with alcohol and a soft cotton cloth. |
| Function control works too freely. | 1. Tension springs (47 or 48) disconnected or broken. | 1. Connect or replace tension springs (47 or 48). |
| Little or no brake action. | 1. Misadjusted brake cord (56). 2. Brake cord (56) broken. 3. Loosen pulley on spindle shaft. | 1. See "Brake Release" under Adjustment. 2. Replace brake cord (56). 3. Tighten set screw on pulley. |

CLEANING

The pressure roller (13), capstan sleeve (10), record-playback head (20), erase head (22), and tape guides should be cleaned occasionally to remove the tape residue which is worn off the tape as it passes these parts. Use a soft cloth and alcohol to clean the parts.

LUBRICATION

All rotating parts are provided with oilite type bearings and need no lubrication for a long period of time. When the recorder is disassembled for service, clean all bearings and apply a thin film of oil on the bearings. Apply a thin coating of grease on all slide levers and detent rollers.

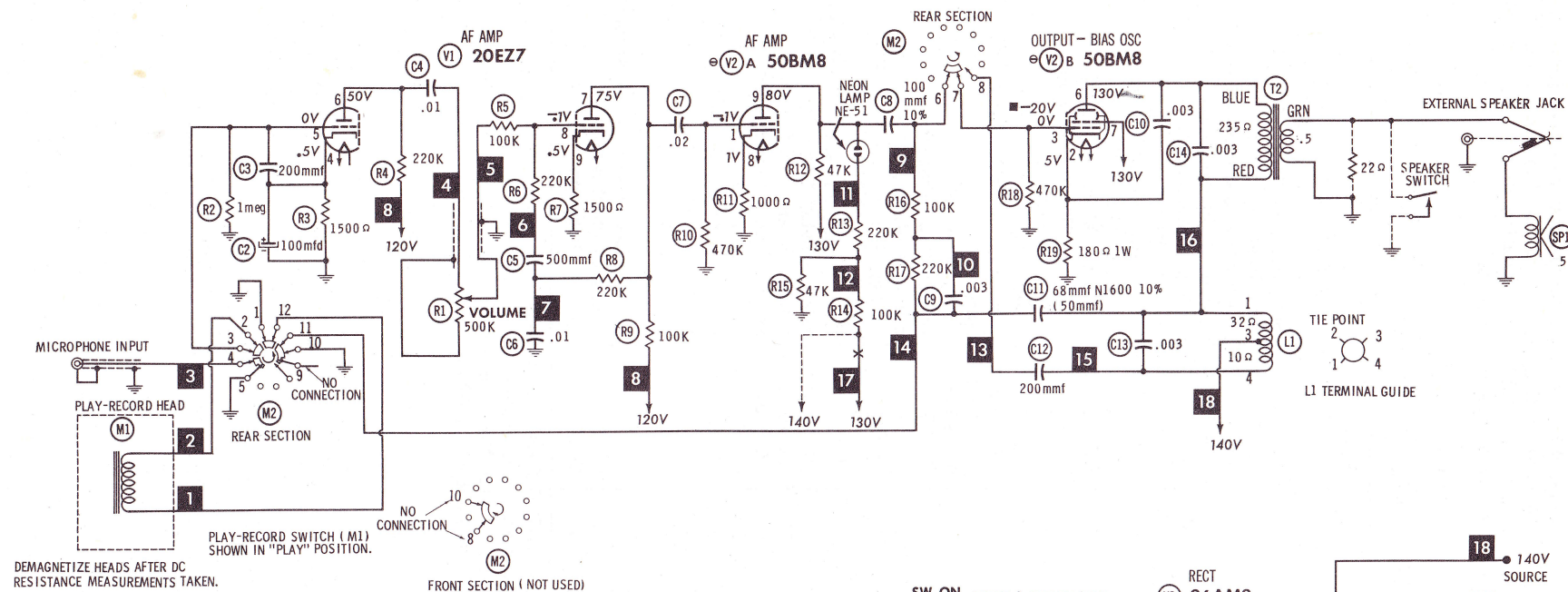
MECHANICAL PARTS LIST

| Ref. No. | Part No. | Description | Ref. No. | Part No. | Description |
|----------|----------|--|----------|----------|-------------------------------------|
| 1 | | Screw, Rear Escutcheon Mounting | 31 | 960070 | Stop Bracket, Rewind |
| 2 | TK-251 | Knob, Wind-Rewind | 32 | 960071 | Stop Bracket, Wind |
| 3 | 460026 | Knob, Volume Control | 33 | TF-304 | Flywheel & Capstan Assembly |
| 4 | TA-1984 | Knob, Function Control | 34* | TO-171* | * Belt, Flywheel Drive |
| 5 | TE-279 | Escutcheon, Rear | 35 | 120017 | Pulley, Spindle Belt |
| 6 | TA-1985 | Escutcheon, Front | 36 | | Pulley, Brake |
| 7 | TP-1603 | Dress Plate, Motor Board | 37 | TP-849 | Sub-Plate, Motor Board |
| 8 | 460012 | Spindle | 38 | TB-234 | Bearing, Motor Pivot |
| 9 | | Washer | 39 | 960065 | Bracket, Motor Mounting |
| 10 | TA-1037 | Capstan Sleeve Assembly | 40 | | Bracket, Brake Rod Guide |
| 11 | | Retaining Ring | 41 | TM-274 | Motor Shock Mounts |
| 12 | | "E" Ring | 42* | TB-998* | *Belt, Take-up |
| 13* | TR-1846* | * Pressure Roller | 43 | TA-1988 | Drive Motor with Pulley |
| 14 | | Washer | 44 | TF-337-1 | Fan |
| 15 | TT-7121 | Guide, Tape | 45* | TB-999* | *Belt, Rewind |
| 16 | TG-435 | Guide, Tape | 46 | TA-1003 | Switch Cam Assembly |
| 17 | TA-1986 | Pressure Roller Plate Assembly | 47 | TS-1682 | Spring, Switch Detent Lever |
| 18 | | Screw, Azimuth Adjustment | 48 | 360011 | Spring, Pressure Roller Plate Lever |
| 19 | 360012 | Spring, Record Head | 49 | TL-349 | Cam Lever, Pressure Roller Plate |
| 20 | TH-494 | Record-Playback Head | 50 | TA-1015 | Wind-Rewind Lever Assembly |
| 21 | TB-2028 | Bracket, Record-Playback Head Mounting | 51 | 360009 | Spring, Brake Rod Return |
| 22 | TA-1967 | Erase Magnet Assembly | 52 | TA-1004 | Switch Detent Lever Assembly |
| 23 | 360018 | Spring, Erase Magnet Return | 53 | TS-1625 | Slide, Interlock |
| 24 | TA-1987 | Bracket, Pressure Pad Assembly | 54 | TB-858 | Bracket, Brake Release |
| 25 | | Retaining Ring | 55 | 360010 | Spring, Brake |
| 26 | 360015 | Spring, Pressure Pad Tension | 56 | TB-1004 | Brake Cord |
| 27 | TB-1026 | Pivot, Pressure Pad Bracket | 57 | | Spring |
| 28 | | "E" Ring | 58 | | Lever, Record-Playback Actuating |
| 29 | TT-657 | Guide, Tape | 59 | TA-1031 | Interlock Shaft Assembly |
| 30 | 960059 | Motor Board | 60 | 360016 | Spring, Take-up |

- * Pressure Roller, WALSCO Part No. 1482-04
- * Drive Belt, WALSCO Part No. 1410-14
- * Take-Up Belt, WALSCO Part No. 1409-10
- * Rewind Belt, WALSCO Part No. 1409-04

KNIGHT
MODEL KN4035 (35DU805)

FOLDER 8



RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|------|-------|-------------|--------------|--------------|---------------|----------------------|----------------|-----------------|---------------|---------------|
| V1 | 20EZ7 | 30 Ω | 0 Ω | 15 Ω | 1500 Ω | 1meg 700 Ω | † 235K | † 115K | 100K | 1500 Ω |
| V2 | 50BM8 | 470K | 180 Ω | 470K 200K | 100 Ω | 30 Ω | † 487 Ω | † 1220 Ω | 1000 Ω | † 48K |
| V3 | 36AM3 | NC | NC | 130 Ω | 100 Ω | 50 Ω | 115 Ω | † | | |

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.

■ TAKEN IN "RECORD" POSITION.

† MEASURED FROM PIN 7 OF V3

† THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

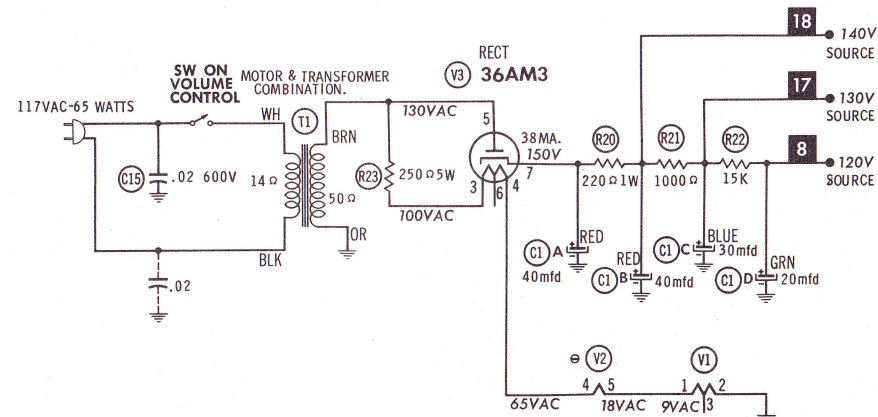
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

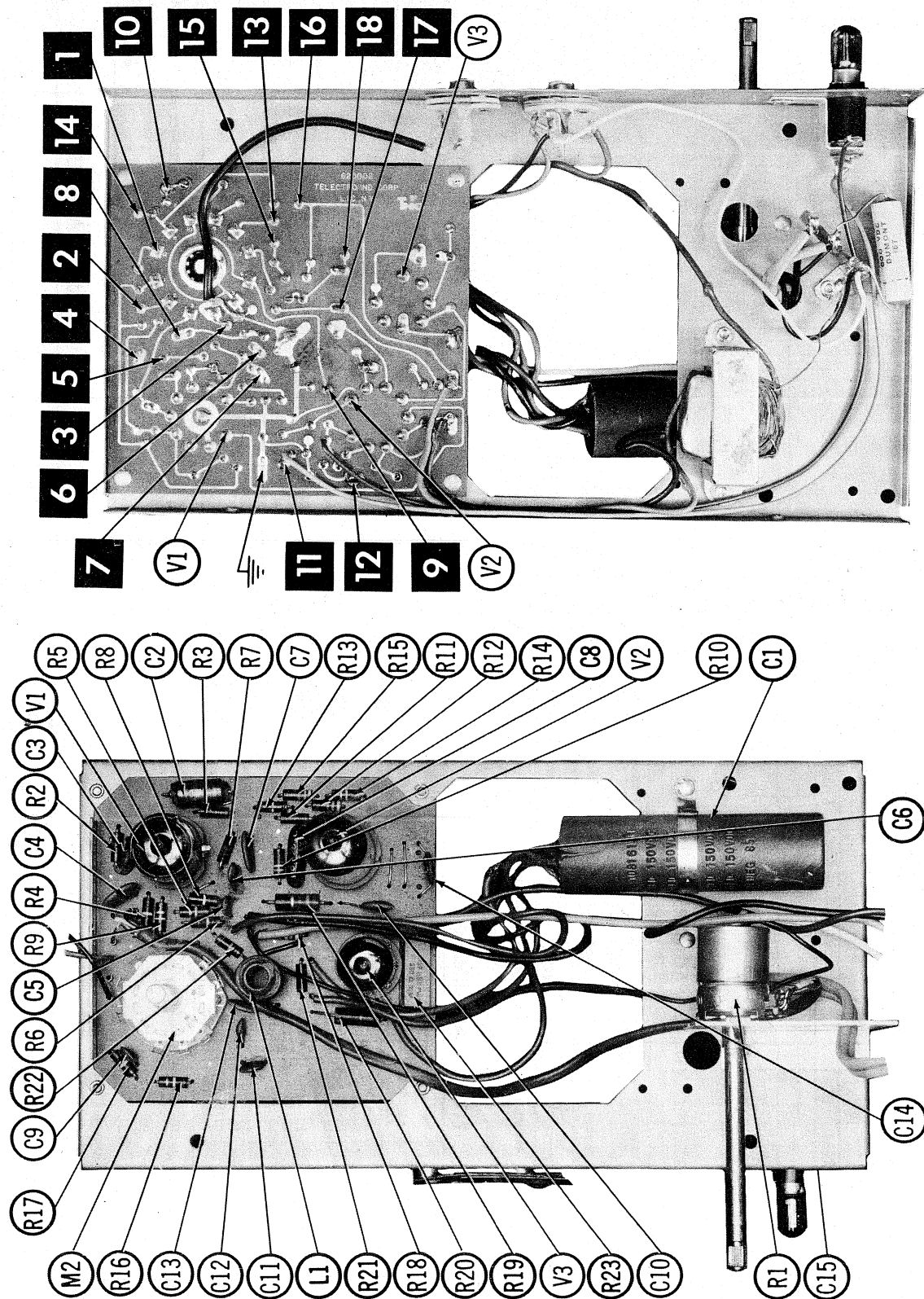
- DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
- Socket connections are shown as bottom views.
- Measured values are from socket pin to common ground.
- Line voltage maintained at 117 volts for voltage readings.
- Nominal tolerance of component values makes possible a variation of $\pm 15\%$ in voltage and resistance readings.
- All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with **CIRCUITRACE**

© Howard W. Sams & Co., Inc. 1962

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

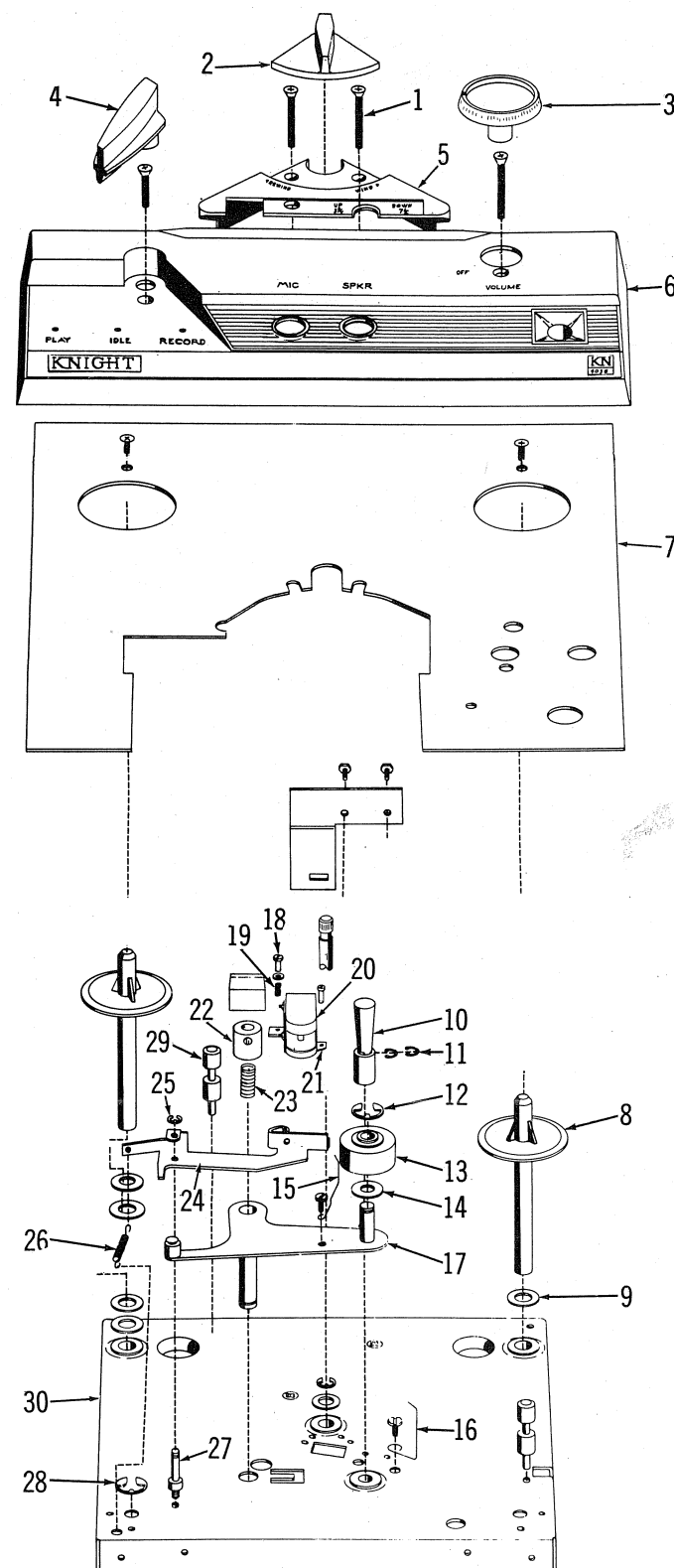
KNIGHT
MODEL KN4035 (35DU805)



AMP. CHASSIS PHOTOS

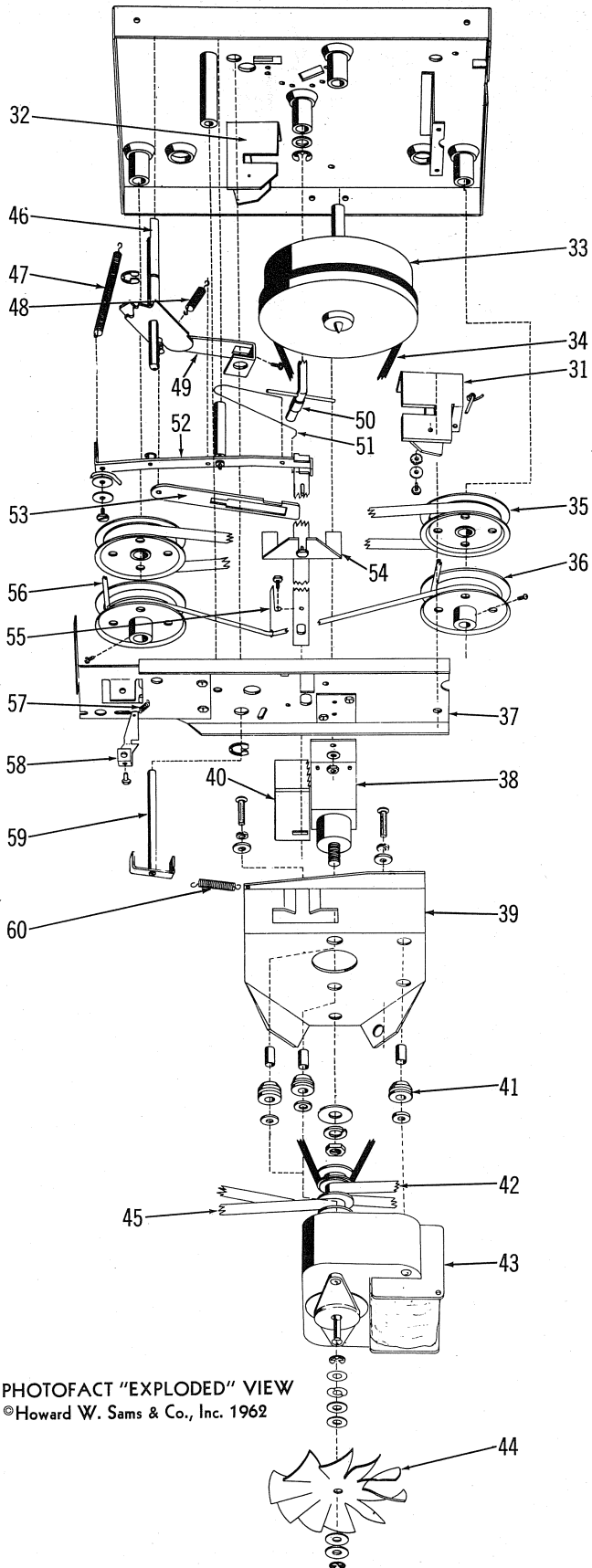
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

A Howard W. Sams **CIRCUITRACE** Photo



A PHOTOFAC "EXPLODED" VIEW
©Howard W. Sams & Co., Inc. 1962

EXPLODED VIEW OF PARTS ABOVE MOTOR BOARD



A PHOTOFACT "EXPLODED" VIEW
 ©Howard W. Sams & Co., Inc. 1962

AMP PARTS LIST AND DESCRIPTIONS

WIRING DATA

| | |
|--|--|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors |
| Power Cord | Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) - 6 Ft. 17109 (Plastic) or 17129 (Rubber) - 9 Ft. |
| Power Cord (Interlock Type) | Use BELDEN No. 8874 (Rubber) or 8895 (Plastic) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 or 8421 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor-Unshielded) 8429 (Two Conductor-Shielded) 8419 (Three Conductor-Shielded) |

TUBES

| AMPEREX | | | GENERAL ELECTRIC | | | RAYTHEON | | | SYLVANIA | | |
|----------|-------------------------------|--|------------------|--|--|----------|-----------|--|----------|--|--|
| ITEM No. | USE | | TYPE | | | ITEM No. | USE | | TYPE | | |
| V1 | AF Amplifier | | 20E27 | | | V3 | Rectifier | | 36AM3 | | |
| V2 | AF Amplifier-Output-Bias Osc. | | 50BM8 (UCL82)* | | | | | | | | |

* Alternate

ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | | |
|----------|--------|-------|------------------|--------------------|---------------------------|---------------------------|------------------|---------------------|------------------|--|
| | CAP. | VOLT. | KNIGHT PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | GENERAL ELECTRIC PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1A | 40 | 150 | TC-1192 | PRS3625 PRS1470 | BBRT43215 BR40-150 | QT3-8 QT1-9 | TCT3105 TC48 | TDLT-3 TD-40-150 | TVAS-4545* | |
| B | 40 | 150 | | | | | | | | |
| C | 30 | 150 | | | | | | | | |
| D | 20 | 150 | | | | | | | | |
| C2 | 100 | 3 | | | | | | | | |
| | | | | PTT13 | NLW100-3 | MT1-22 | TT3X110 | MLV100-3 | TE-1059.5 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | | |
|----------|--------------|---------|------------------|--------------------|---------------------------|-------------------|------------------|------------------|--|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCOR PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C3 | 200 | (50) † | DI-200 | DD-201 | LIOT2 | CCD-201 | GP320 | 10TS-T20 | |
| C4 | .01 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 | |
| C5 | 500 | | DI-500 | DD-501 | BYA10T5 | CCD-501 | B-350 | 10TS-T50 | |
| C6 | 200 | | DI-200 | DD-201 | LIOT2 | CCD-201 | GP320 | 10TS-T20 | |
| C7 | .01 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 | |
| C8 | .02 300V | | P488N-02 | DD-203 | CUB4S2 | 4DP-2-203 | GEM-412 | 4TM-S20 | |
| C9 | 100 10% | | DI-100 | DD-101 | LIOT1 | CCD-101 | GP310 | 10TS-T10 | |
| C10 | .003 | | DI-3000 | DD-302 | BYA10D3 | CCD-302 | GP230 | 10TS-D30 | |
| C11 | 68 N1600 10% | | | | | * | | | |
| C12 | 200 | | DI-200 | DD-201 | LIOT2 | CCD-201 | GP320 | 10TS-T20 | |
| C13 | .003 | | DI-3000 | DD-302 | BYA10D3 | CCD-302 | GP230 | 10TS-D30 | |
| C14 | .003 | | DI-3000 | DD-302 | BYA10D3 | CCD-302 | GP230 | 10TS-D30 | |
| C15 | .02 600V | | P688N-02 | DD-203 | CUB6S2 | 6DP-2-203 | GEM-612 | 6TM-S20 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

† Alternate Value.

CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | USE | RESISTANCE | REPLACEMENT DATA | | | | |
|----------|-----------------|------------|------------------|--------------------|-----------------------------|--------------------|----------------------|
| | | | KNIGHT PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. |
| R1 | Volume & Switch | 500K | 560001 | AB-60, KR-1, AK-11 | A47-500-Z/ KSS-5, SWE-12 | Q13-133, AQ5, 76-1 | UA55A, SL3500, US-41 |

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REPLACEMENT DATA | | | ITEM No. | RATING | REPLACEMENT DATA | | |
|----------|--------|------------------|------------------|---------|----------|---------|------------------|------------------|---------|
| | | IRC PART No. | WORKMAN PART No. | REMARKS | | | IRC PART No. | WORKMAN PART No. | REMARKS |
| R2 | 1meg | | | | R13 | 220K | | | |
| R3 | 1500Ω | | | | R14 | 100K | | | |
| R4 | 220K | | | | R15 | 47K | | | |
| R5 | 100K | | | | R16 | 100K | | | |
| R6 | 220K | | | | R17 | 220K | | | |
| R7 | 1500Ω | | | | R18 | 470K | | | |
| R8 | 220K | | | | R19 | 180Ω 1W | | | |
| R9 | 100K | | | | R20 | 220Ω 1W | | | |
| R10 | 470K | | | | R21 | 1000Ω | | | |
| R11 | 1000Ω | | | | R22 | 15K | | | |
| R12 | 47K | | | | R23 | 250Ω 5W | PW5-250 | 5W-SQ-250 | |

COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | NOTES |
|----------|-----------|------------------|----------------|-----------------|------------------|------------------|-------|
| | | KNIGHT PART No. | Merit PART No. | Miller PART No. | Stancor PART No. | Workman PART No. | |
| L1 | Bias Osc. | TC-2463 | | | | | |

TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | NOTES |
|----------|---------------|----------------|--------|------------------|----------------|------------------|---------------------|----------------|-------|
| | PRI. | SEC. 1 | SEC. 2 | KNIGHT PART No. | MERIT PART No. | STANCOR PART No. | THORDARSON PART No. | TRIAD PART No. | |
| T1 | 117VAC @ .72A | 130VAC @ .165A | | 510002 | | | | | |

TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | NOTES |
|----------|-----------|------|------------------|----------------|------------------|---------------------|----------------|----------------------------|
| | PRI. | SEC. | KNIGHT PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 3000Ω | 3-4Ω | 630003 | A-3025 ① | A-3332 ① | 24S53 ① | S-12X ① | ① Drill New Mounting Holes |

SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|----------|------|-------|------------|------------------|---------------|-------|
| | SIZE | FIELD | V. C. IMP. | KNIGHT PART No. | QUAM PART No. | |
| SP1 | 5" | PM | 3-4Ω | TS-1926A | 5A1 | |

TAPE HEAD

| ITEM NO. | MEASURED | | | KNIGHT PART NO. | NORTRONICS PART NO. | DESCRIPTION |
|----------|------------|------------------------|------------|-----------------|---------------------|--|
| | INDUCTANCE | BIAS/ERASE VOLTS (RMS) | BIAS FREQ. | | | |
| M1 | 945MH | 34 Volts | 52KC | 10L17-104 | 3050 * QK-20 † | * 2 Track Monaural Head † Mounting Kit for Head |

MISCELLANEOUS

| ITEM No. | PART NAME | KNIGHT PART No. | NOTES |
|----------|-----------|-----------------|---------------------------------|
| M2 | Switch | | Play-Record (Rotary Wafer Type) |